

## IGURE 1/

Predicted Responses/Treatment Non-Predictive Patient Data/Symptoms Predictive Database Web Based Server Symptom Profiler Symptoms Clinical Database Treatment Recommendations and Predicted Responses ZHWCZWH Patients Data Thin Client (PC Based) User

FIGURE 1B

The activation is passed through a function to produce an output O((t)=f(a(t))At each point in time each unit has an activation value a(t) The weight determines the strength of the effect ≥

FIGURE 1C

Individual Patient Recovery Profile Monitor Recovery Phase Pattern Predictor Treatment Selection Treatment Slection Phase Outcome Predictor (Multiple treatments) Baseline Diagnostic Information Diagnosis Criteria

FIGURE 2

FIG. 3-2

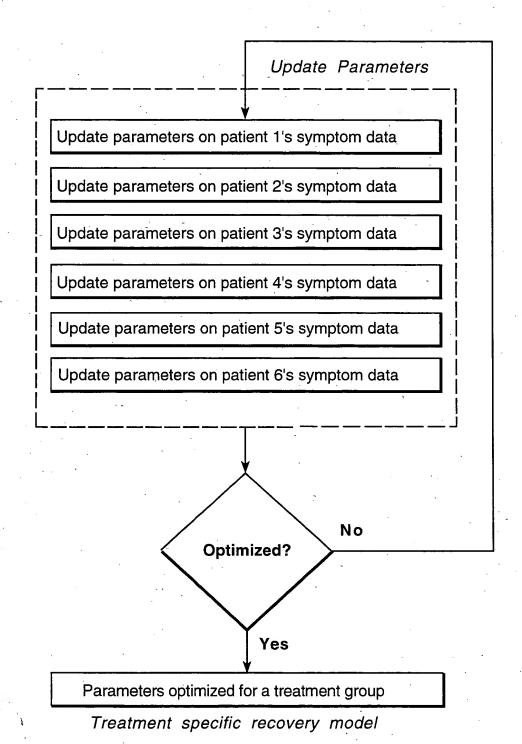


FIG. 3-3

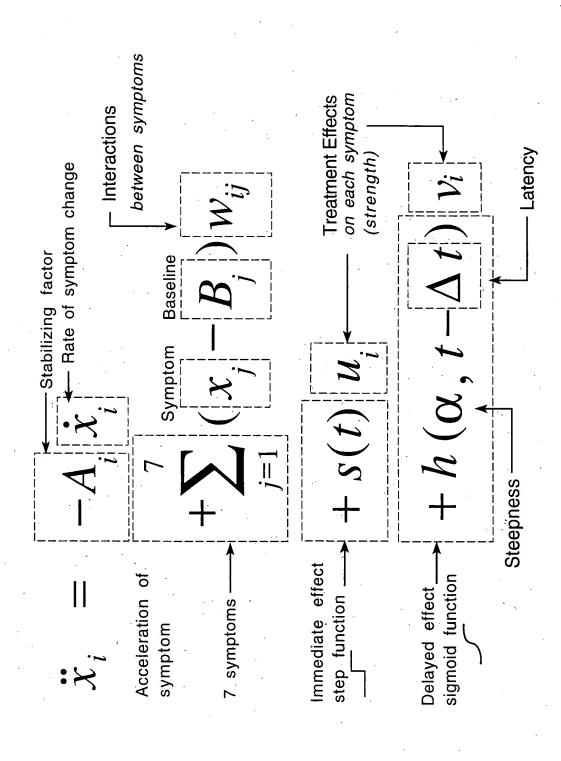
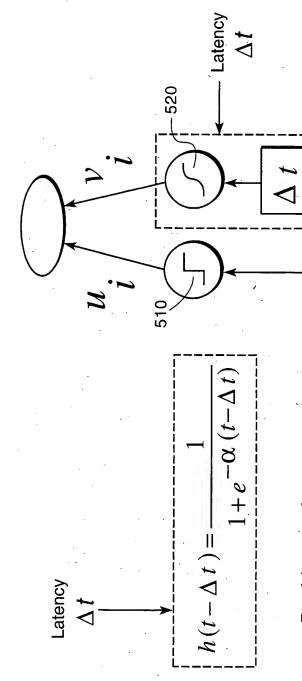


FIG. 3-5

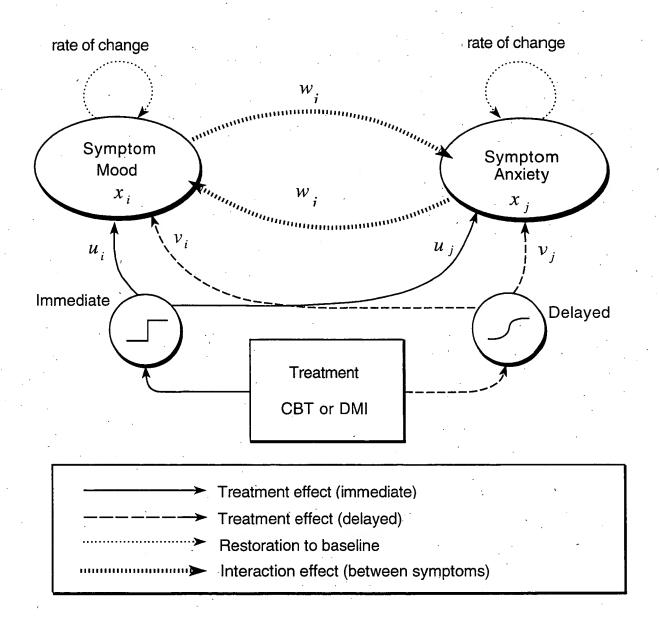


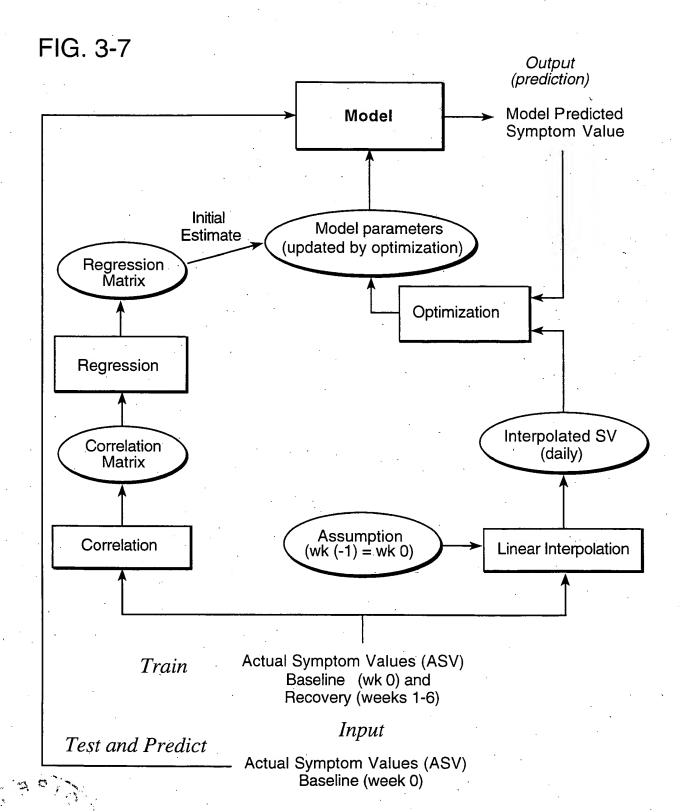
 $\alpha$  Rapidness of response

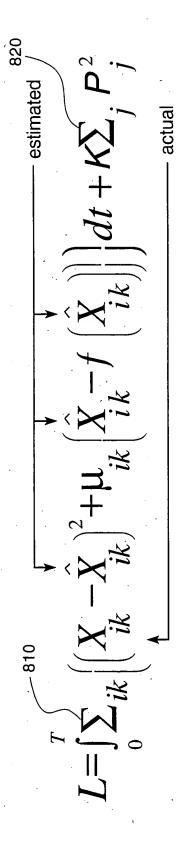
 $\Delta t$  Latency

Treatment onset

FIG. 3-6







Obtain optimized parameters

Error term

symptoms parameter

data

|| |}

patients

k =

- fit patient data
- train on entire recovery period
- minimize error term L
- gradient descent on parameters

FIG. 3-9A

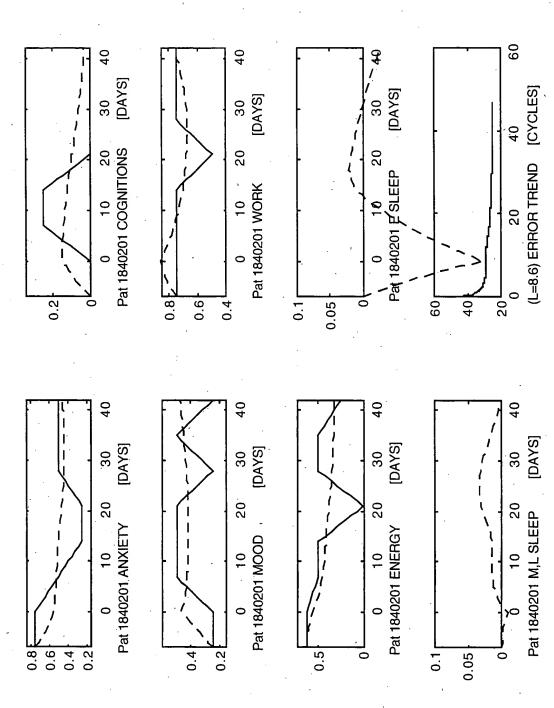
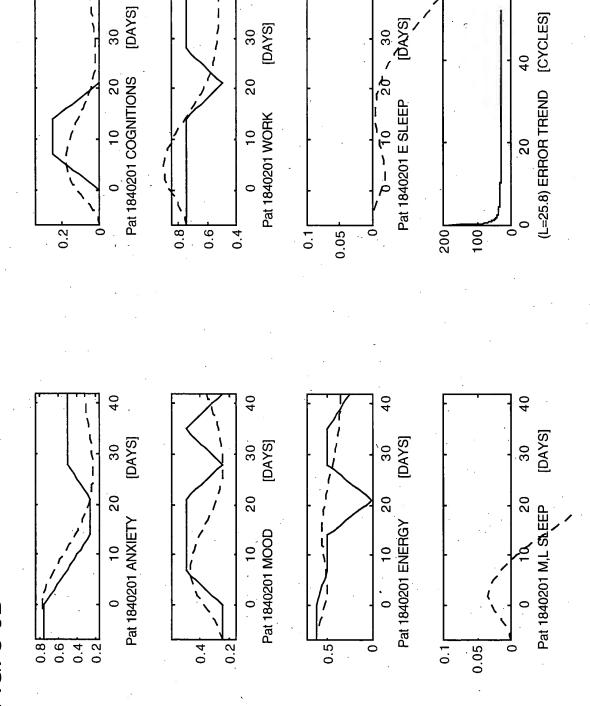
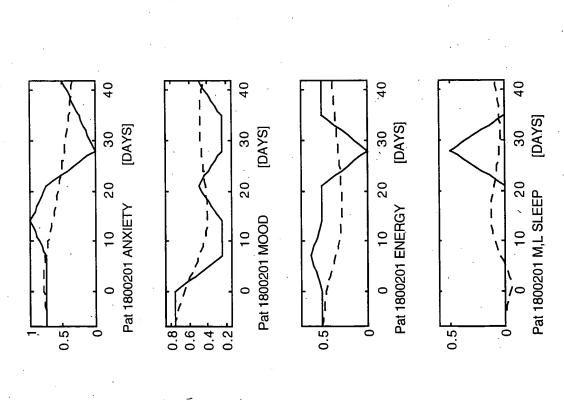


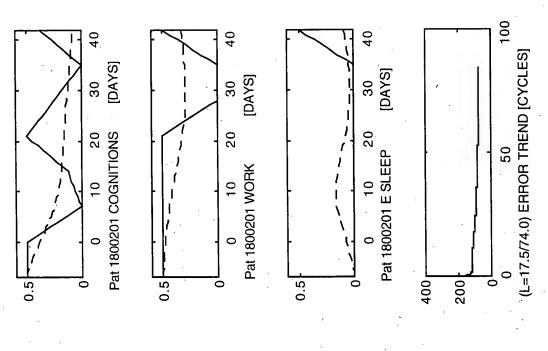
FIG. 3-9B

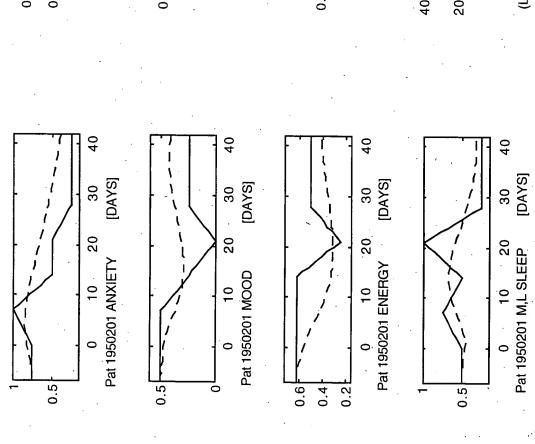


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FIG. 3-10A







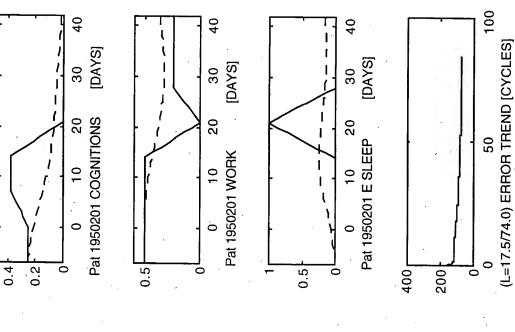
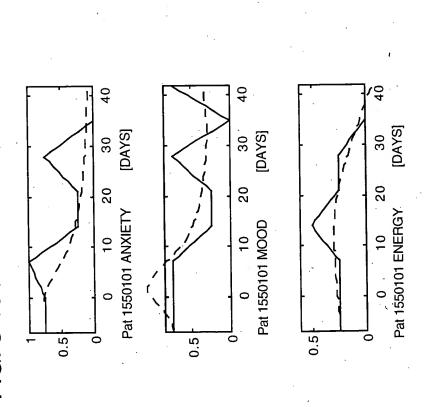


FIG. 3-10C

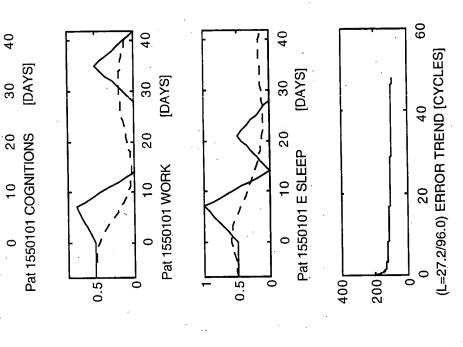


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0.0000 7.46.91

[DAYS]



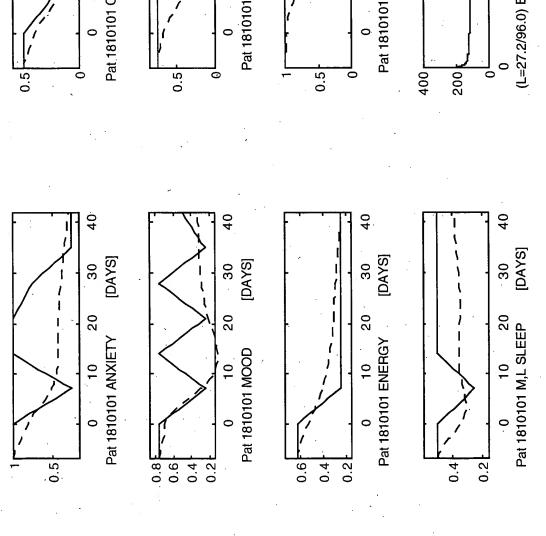
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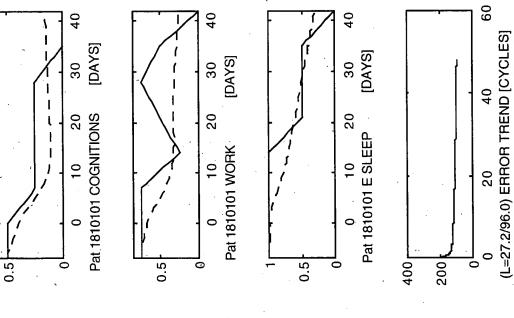
30 [DAYS]

0 10 20 Pat 1550101 M,L SLEEP

0.5

FIG. 3-10D





0 100 200 (L=3.1) ERROR TREND 0 10 2 Pat 0 COGNITIONS Pat 0 E SLEEP 0 10 Pat 0 WORK 0.3 0.2 0.6 0.4 0.2 0.4 100 0.5 0 30 [DAYS] 30 30 [DAYS] [DAYS] 20 3 [DAYS] 20 0 10 2 Pat 0 M,L SLEEP 0 10 Pat 0 ANXIETY 0 10 Pat 0 ENERGY 0 10 Pat 0 MOOD FIG. 3-11A 0.8 0.6 0.6 0.4 9.0 0.4

[DAYS]

40

) 30 [DAYS]

400

300 [CYCLES]

40

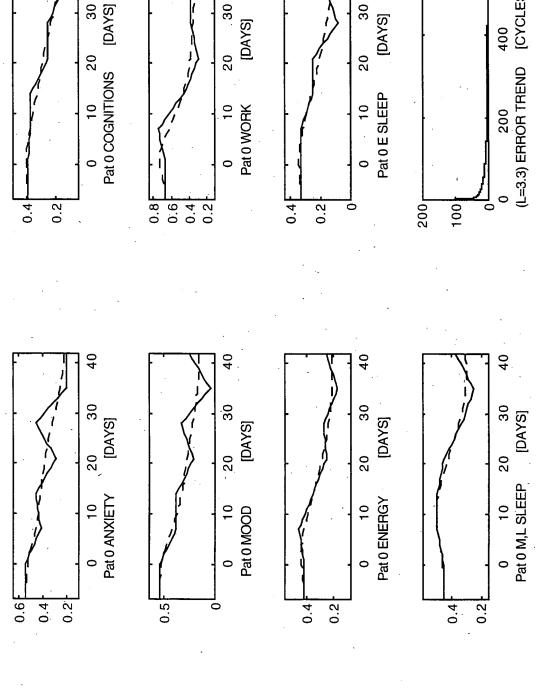
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20

[DAYS]

FIG. 3-11B

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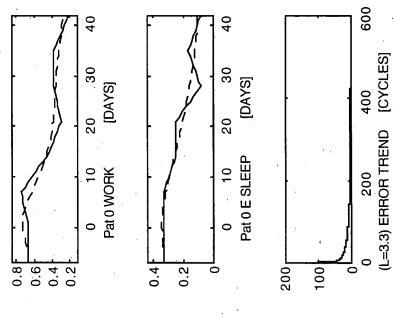
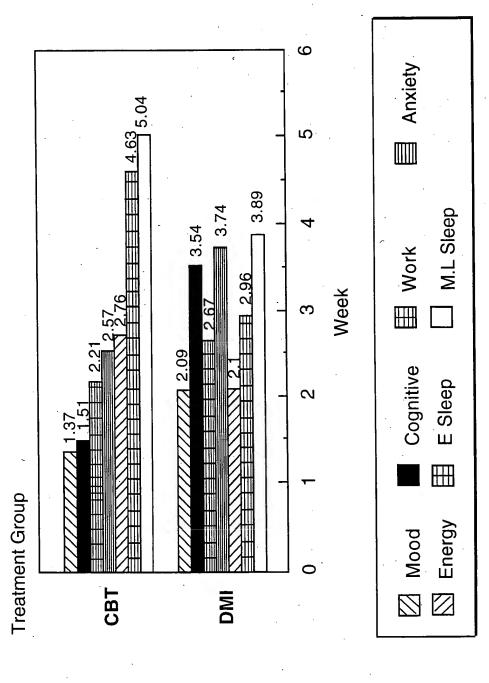
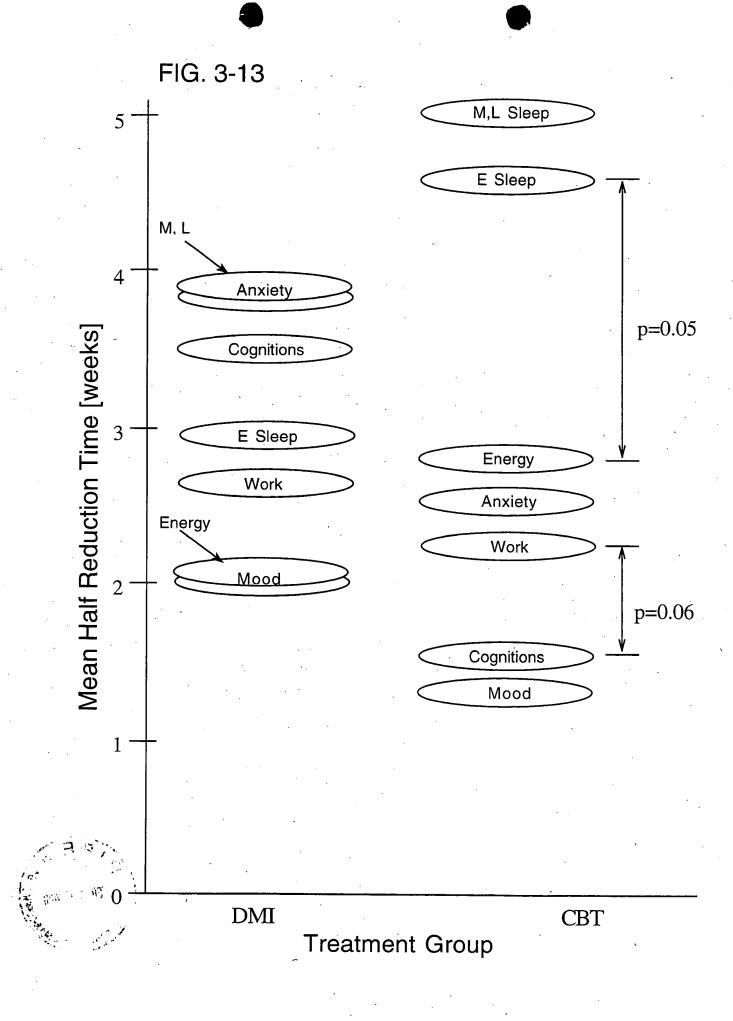
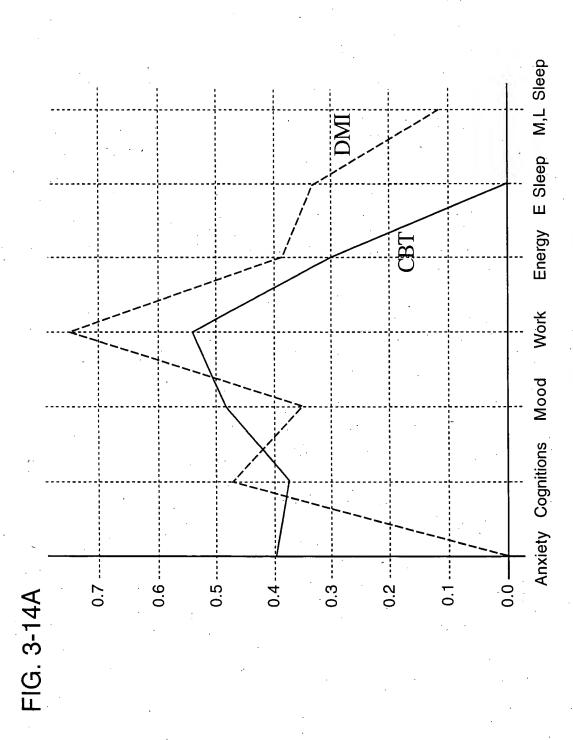


FIG. 3-12

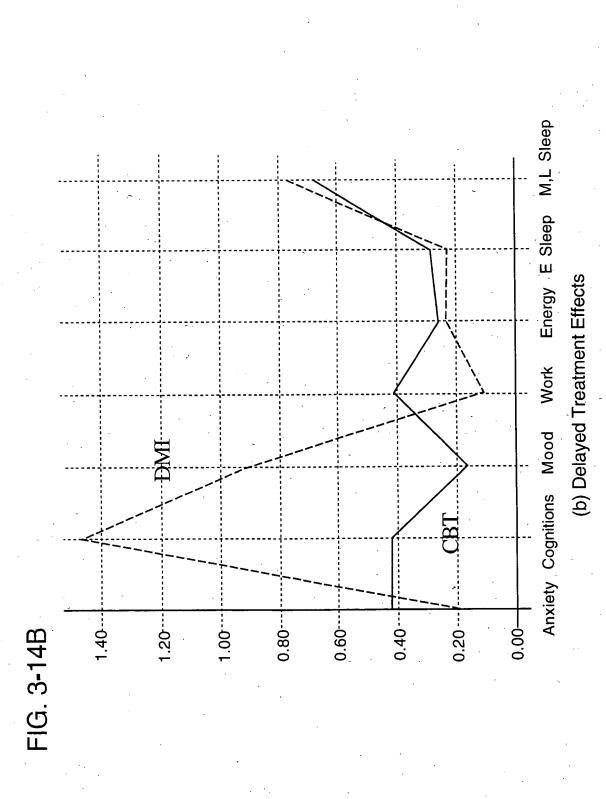
Mean Half Reduction Time

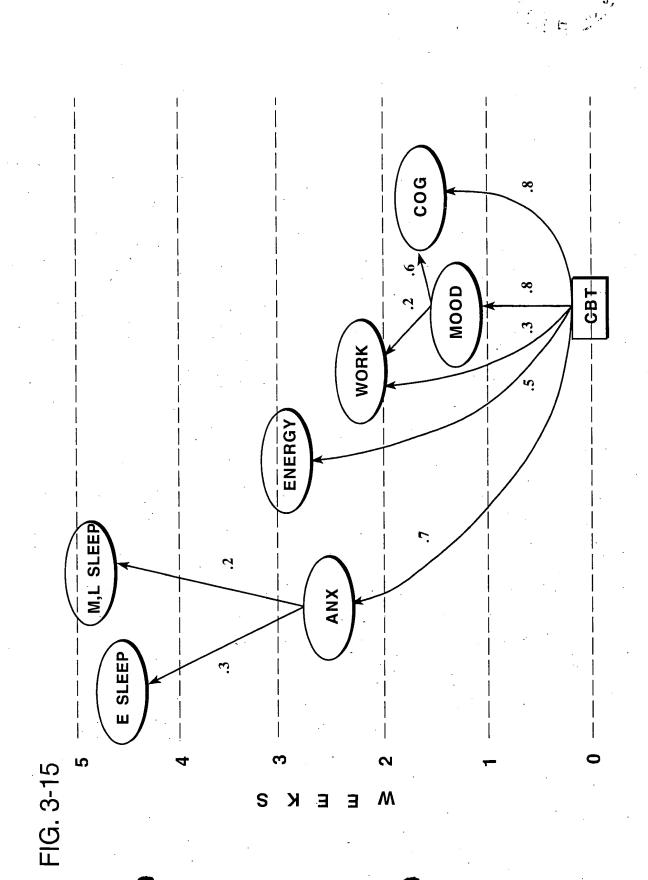






(a) Immediate Treatment Effects





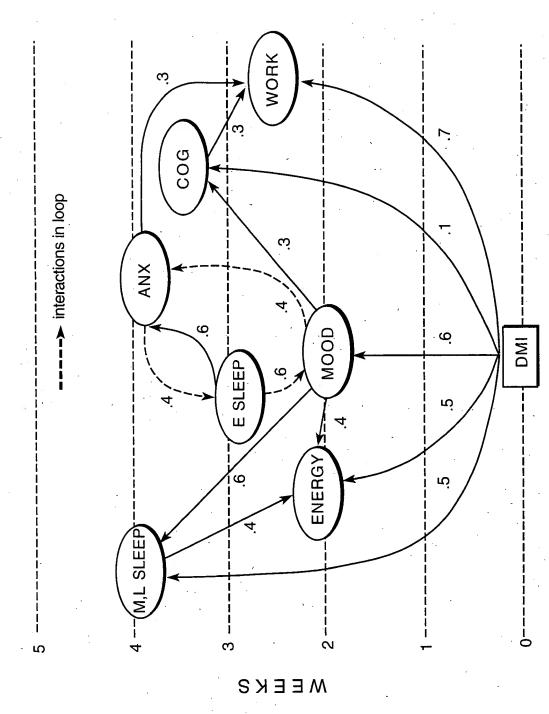
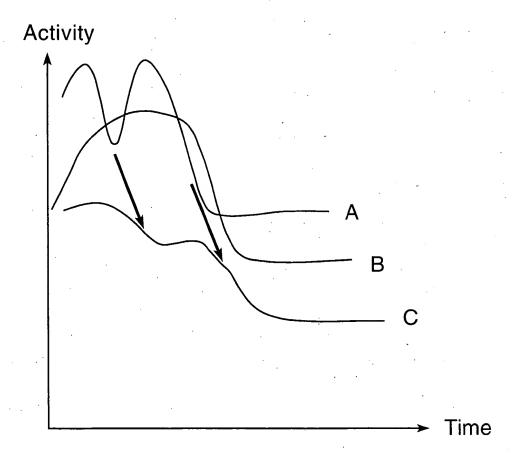
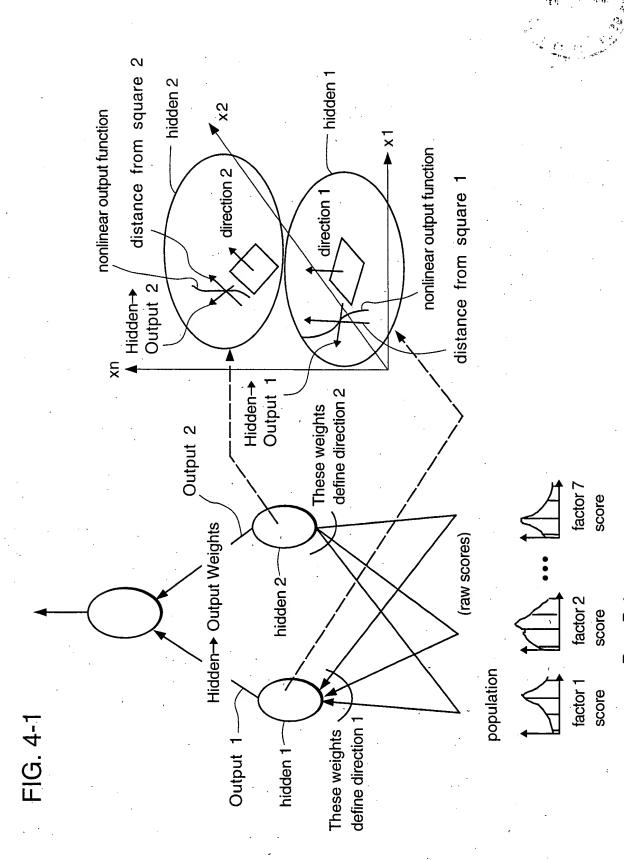


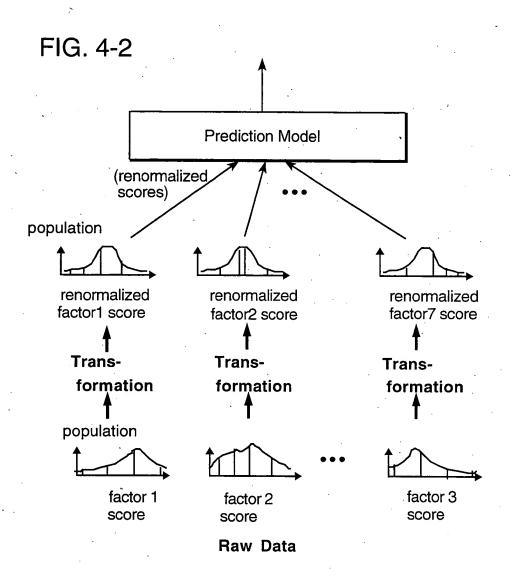
FIG. 3-16

FIG. 3-17





Raw Data



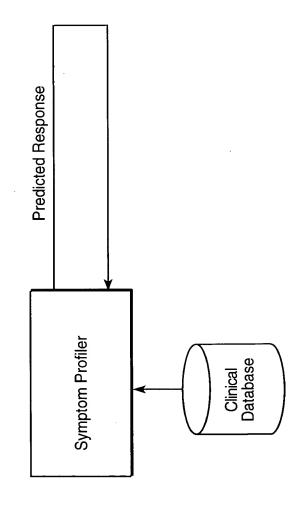


FIGURE 1A

FIGURE 1B

## Table 4.1

Prediction of Outcome from Baseline Symptoms														
Symptom	Treatment											· · - · ·		
HDRS Item	Other			Tricyclic				MAOI		SSRI	Psycho- therapy		ECT	
		Ami	Nor	IMI	DMI	Clo	Lev	Мар	Phe	Tran	Flu	IPT	CBT	ECT
Severity	5 <u>,9</u>	<u>10-</u>		<u>10-</u> ,11 <u>,16</u> + <u>,17+</u>	1,8	8,13	<u>3</u> _	<u>3–,6+</u>	<u>17+</u>		1	<u>16+</u>	7	14-
Depressed Mood	2	<u>10-</u> ,15	4	<u>10–,</u> 11	1,8	8			4	<u>18+</u>	1			14-
Feelings of Guilt		15		11	1,8	8				. 18	1			14
Suicide	5	15		.11	1,8	8				18	1			14
Insomnia: early	2	15	4	11	1,8	8			12,4	18	1			14
Insomnia: middle	2	<u>15-</u>	4	11	1,8	8			12,4	<u>18-</u>	1			14
Insomnia: late	2	15	4	11 <u>,12+</u>	1,8	8		, "	4	<u>18-</u>	1			14
Work and Interests		15	4	11,12	1,8	8			11	18	1			14-
Retardation	2	10, 15	4	10,11 <u>,12+</u>	1,8	8			4	<u>18+</u>	1			18
Agitation	. 2	10, 15		10,11,12	1,8	8			12,4	18	1			14-
Anxiety : somatic	2	10,15	4	10, 11	1,8	8			4	18	1			
Anxiety : psychic	2	10,15	4	10, 11	1,8	8			4	18	1			
Somatic: gastrointestinal		<u>15-</u>		11	1,8	8			,	18	1	`		14-
Somatic: general		10, 15	4	10, 11	1,8	8			4	18	1			
Genital symptoms		15		11, 12	1,8	8			11	18	1			14
Hypochondriasis		<u>15</u> _	4	11 .	1,8	8	٠,		4	18	1			14
Loss of Weight (or change)	2	15	4	11, 12	1,8	8			12,4	<u>18+</u>	1			14
Insight	. 1	<u>15+</u>		11	1,8	8				18	1			
Diurnal variation		15	4	11, 12	1,8	8			12,16	18	1			14
Depersonaliztion and derealization		15		11	1,8	8				18	1			
Paranoid symptoms	2	15		- 11	1,8	8				18	1			
Obsessive and compulsive	2	15		.11	1,8	8				18	1		<u>.</u> .	

## Table 4.2

- 1. Bowden, C., Schatzberg, A., Rosenbaum, A., Contreras, S., Samson, J., & Dessain, E. (1993). Fluoxetine and desipramine in major depressive disorder. Journal of Clinical Psychopharmacology, 13, 305-311.
- 2. Carney, M., Reynolds, E., & Sheffield, B. (1986). Prediction of outcome in depressive illnesses by the Newcastle diagnosis scale: Its relationship to with the unipolar/bipolar and DSM-III systems. British Journal of Psychiatry.
- 3. Filip, V., Hoschl, C., Karen, P., Seifertova, D., Bornova, L., Praskova, H., & Prasko, J. (1993). Predicting therapeutic results with levoprotiline and maprotiline in major depression: The role of the outcome criteria. British Journal of Psychiatry, 163, 35-38.
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- 13. Nagayama, H., Nagano, K., Ikezaki, A., & Tashiro, T. (1991). Prediction of efficacy of antidepressant by 1-week test therapy in depression. Journal of Affective Disorders, 23, 213-216.
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- 18. White, K. & White, J. (1986). Tranylcypromine: Patterns and predictors of response. Journal of Clinical Psychiatry, 47, 380-382.

The activation is passed through a function to produce an output O((t)=f(a(t))At each point in time each unit has an activation value a(t)The weight determines the strength of the effect ≥

FIGURE 1C

Individual Patient Recovery Profile Monitor Recovery Phase Pattem Predictor Treatment Selection Treatment Slection Phase Outcome Predictor (Multiple treatments) Baseline Diagnostic Information Diagnosis Criteria

FIGURE 2

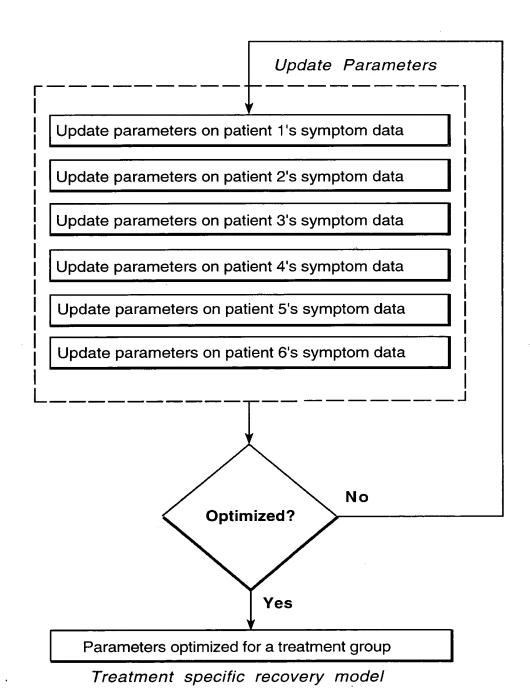


FIG. 3-3

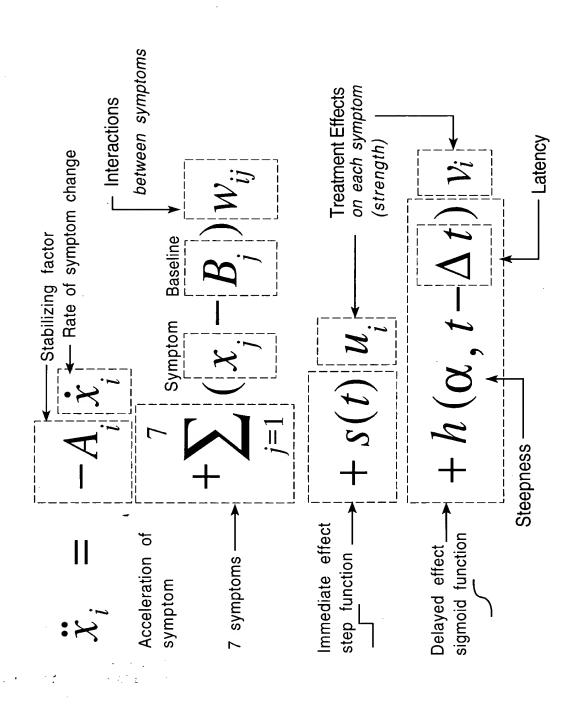


FIG. 3-5

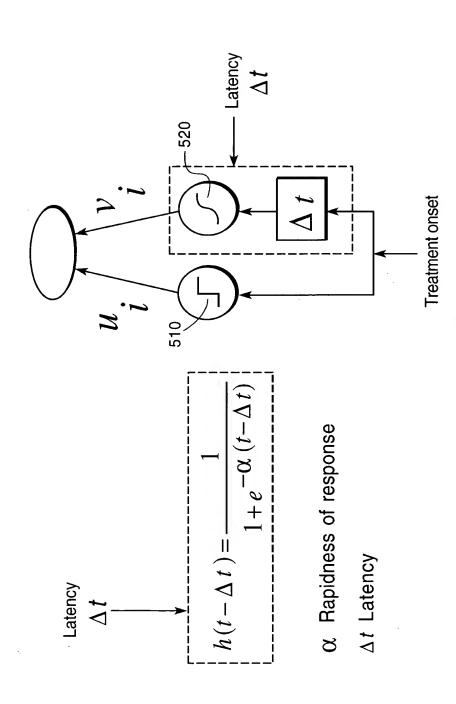
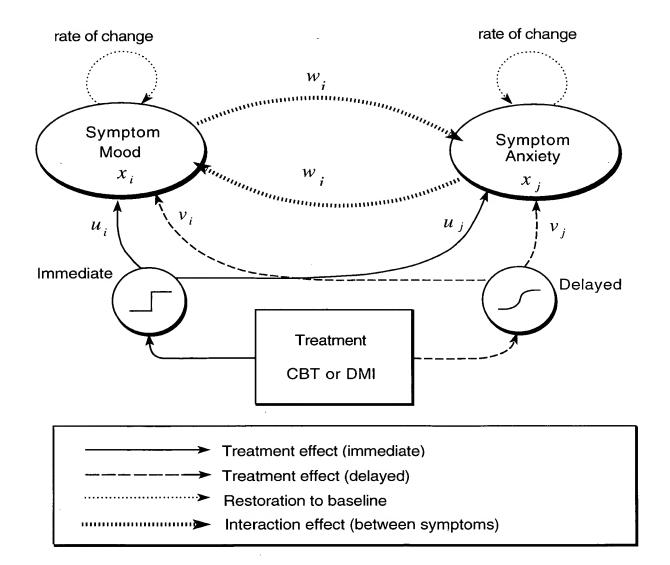
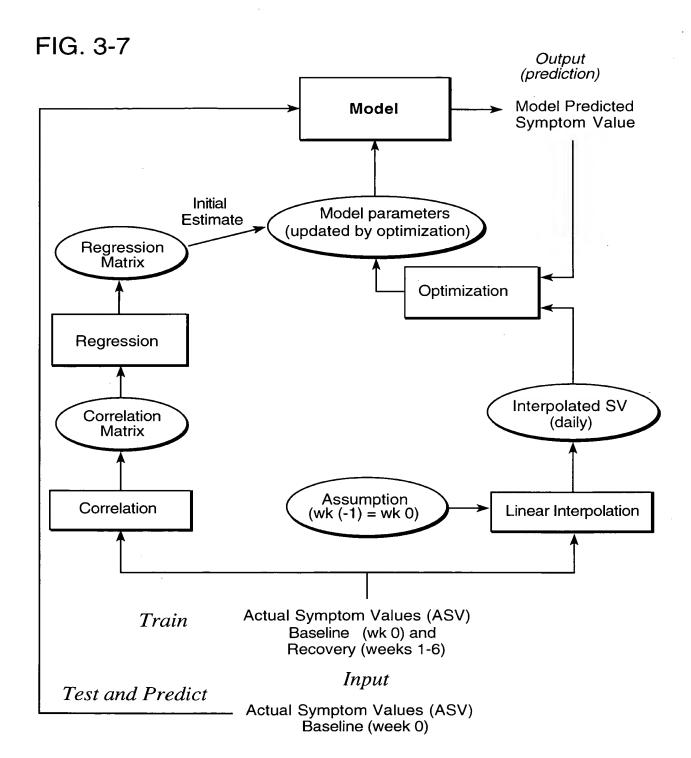
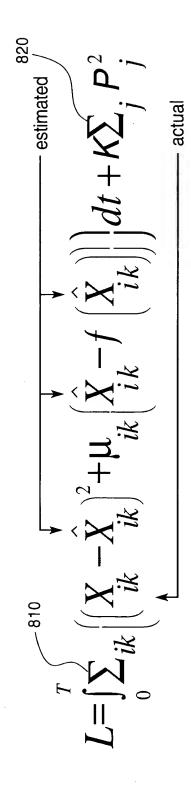


FIG. 3-6







Obtain optimized parameters

Error term

*= T* 

symptoms

patients

**k** =

parameter

data

- fit patient data
- train on entire recovery period
- minimize error term L
- gradient descent on parameters

FIG. 3-9A

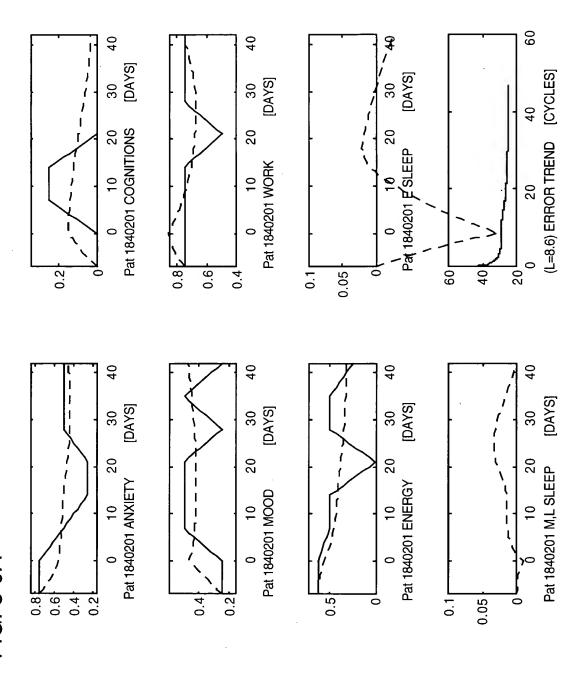
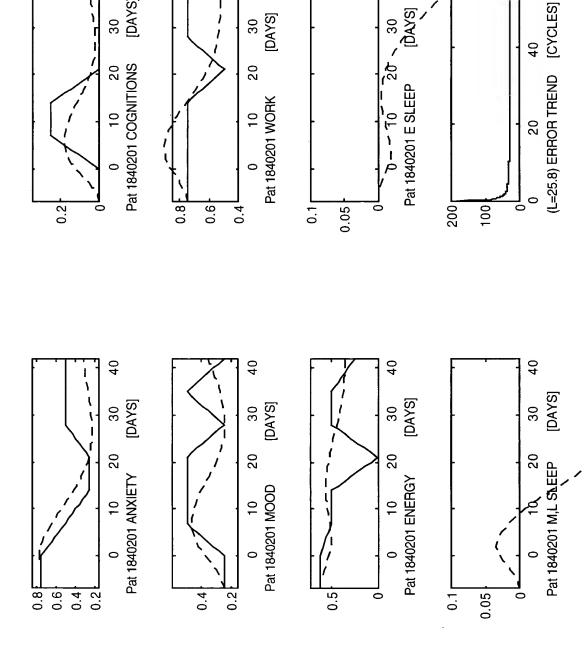


FIG. 3-9B



[DAYS]

[DAYS]

FIG. 3-10A

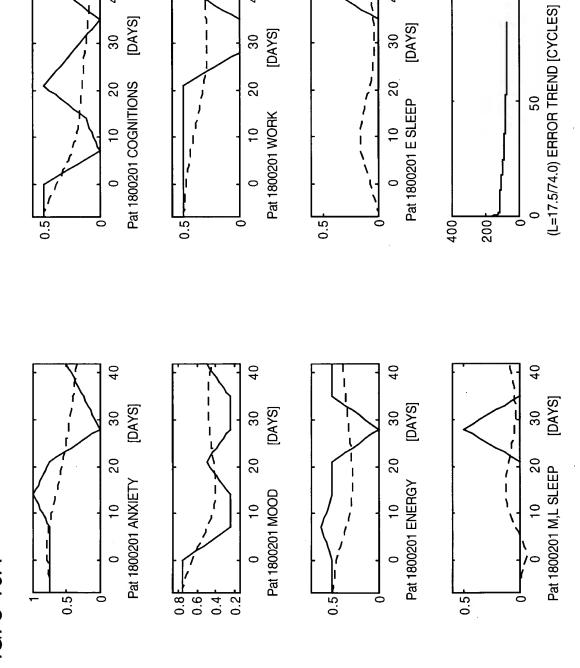


FIG. 3-10B

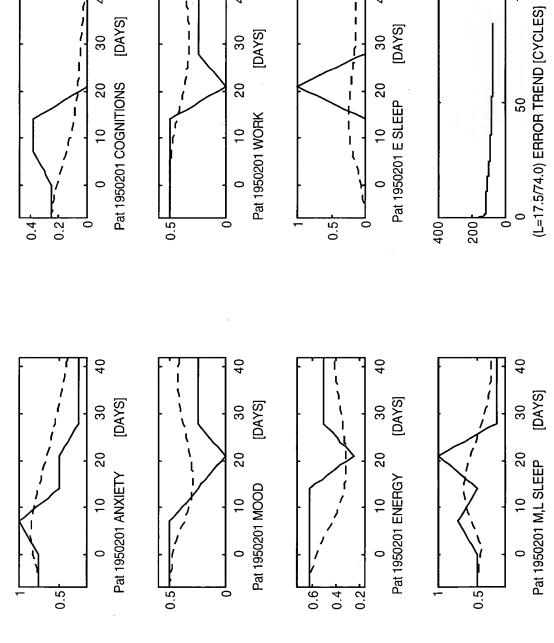


FIG. 3-10C

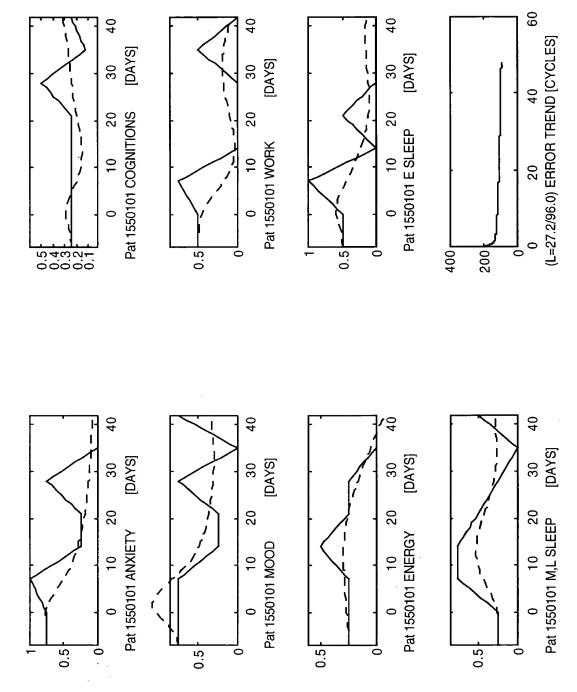
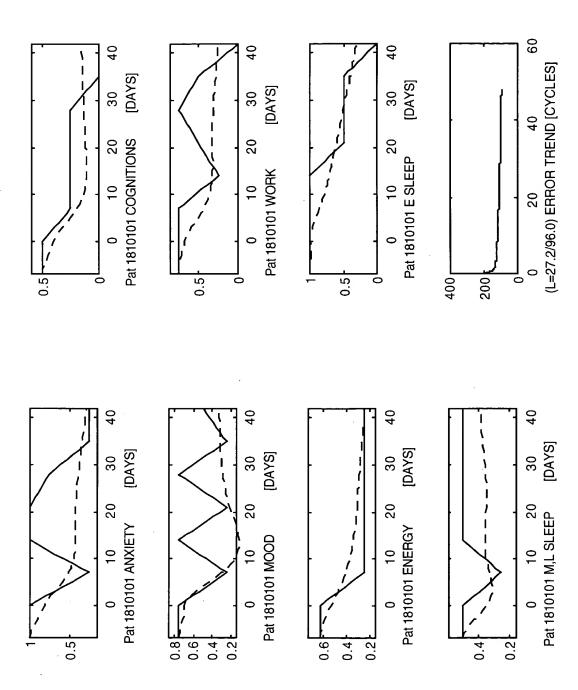


FIG. 3-10D



0 100 200 300 (L=3.1) ERROR TREND [CYCLES] 30 [DAYS] [DAYS] [DAYS] 20 0 10 20 Pat 0 COGNITIONS 0 10 Pat 0 E SLEEP 0 10 Pat 0 WORK 0.3 0.2 0.6 0.4 0.2 0.4 0.2 200 r 100 0.1 40 30 30 30 0 10 20 30 Pat 0 M,L SLEEP [DAYS] [DAYS] [DAYS] [DAYS] 20 20 0 10 Pat 0 ANXIETY 0 10 Pat 0 ENERGY 0 10 Pat 0 MOOD FIG. 3-11A 0.8 0.6 0.6E 0.6 0.2 0.4 0.4 0.2 0.4

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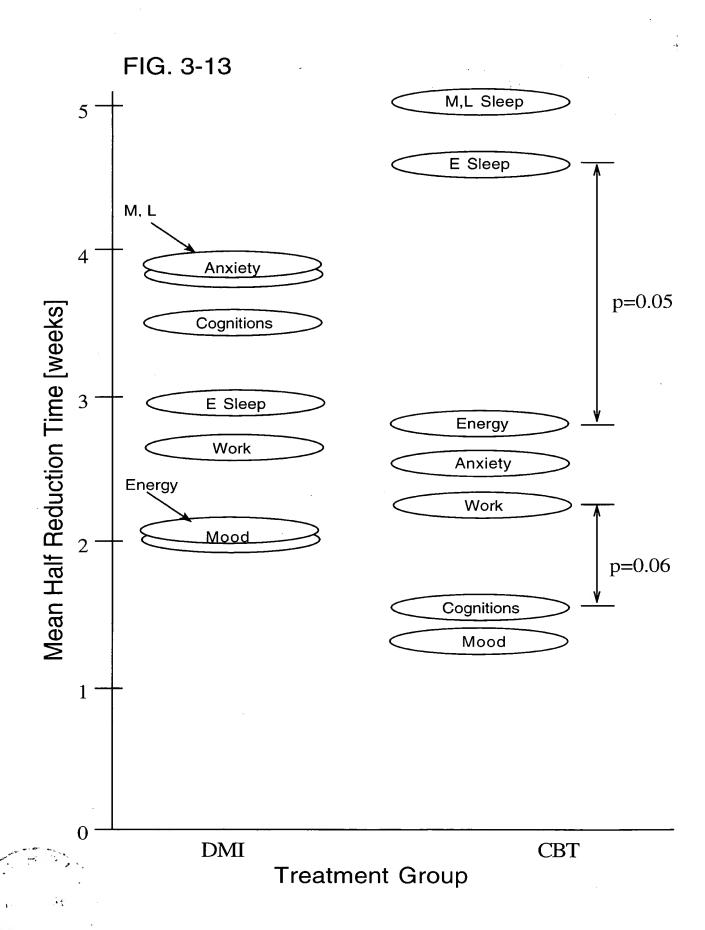
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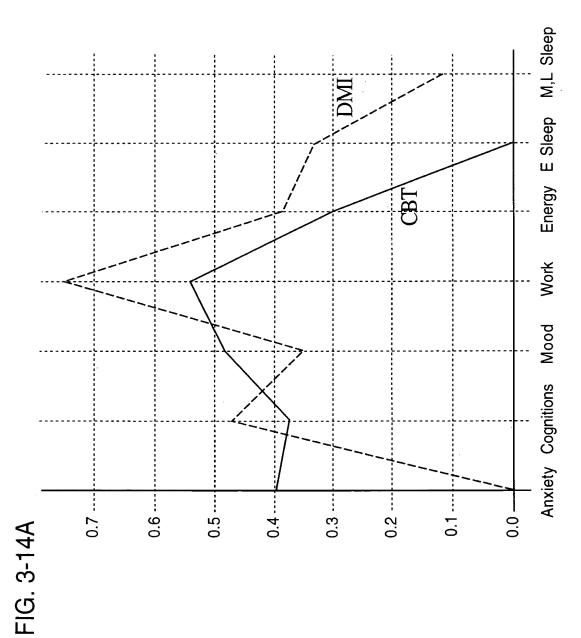
0 200 400 (L=3.3) ERROR TREND [CYCLES] 0 10 20 30 Pat 0 COGNITIONS [DAYS] [DAYS] [DAYS] 20 0 10 Pat 0 E SLEEP 0 10 Pat 0 WORK 0.8 0.6 0.4 0.2 0.4 0.2 100 0.4 0.2 40 20 30 [DAYS] [DAYS] [DAYS] [DAYS] 20 20 0 10 20 Pat 0 M,L SLEEP 0 10 Pat 0 ANXIETY 0 10 Pat 0 ENERGY 0 10 Pat 0 MOOD FIG. 3-11B 0.6 0.2 0.4 0.5 0.4 0.2 0.4 0.2

900

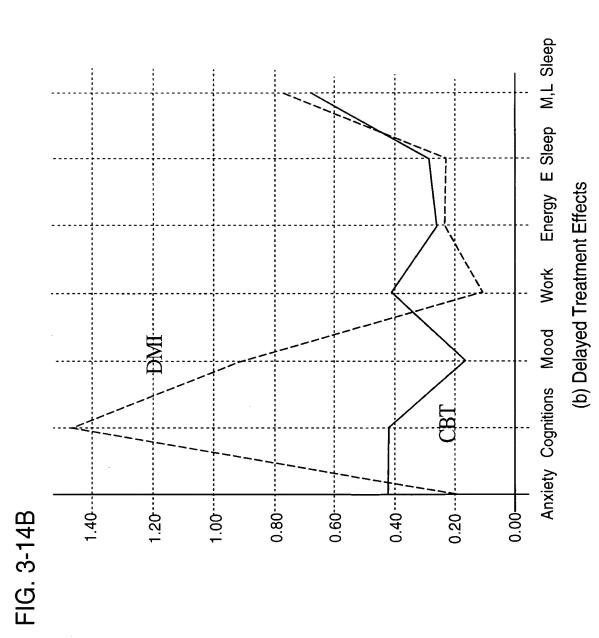
FIG. 3-12

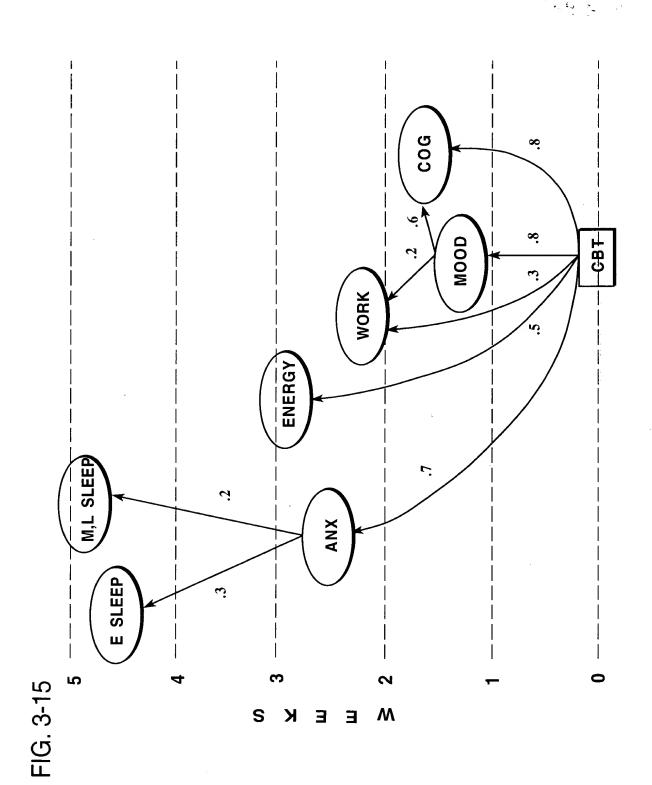
9 Anxiety Ŋ 3.89 3.74 M.L. Sleep 3.54 Mean Half Reduction Time Work Week က 777 2.09 Cognitive E Sleep  $\alpha$ Treatment Group Energy Mood CBT 





(a) Immediate Treatment Effects





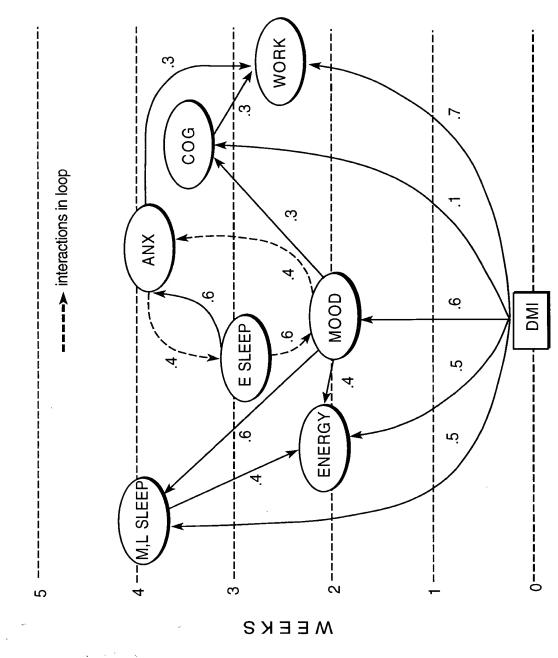
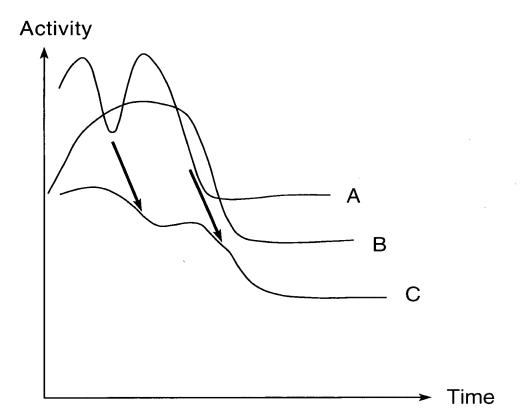
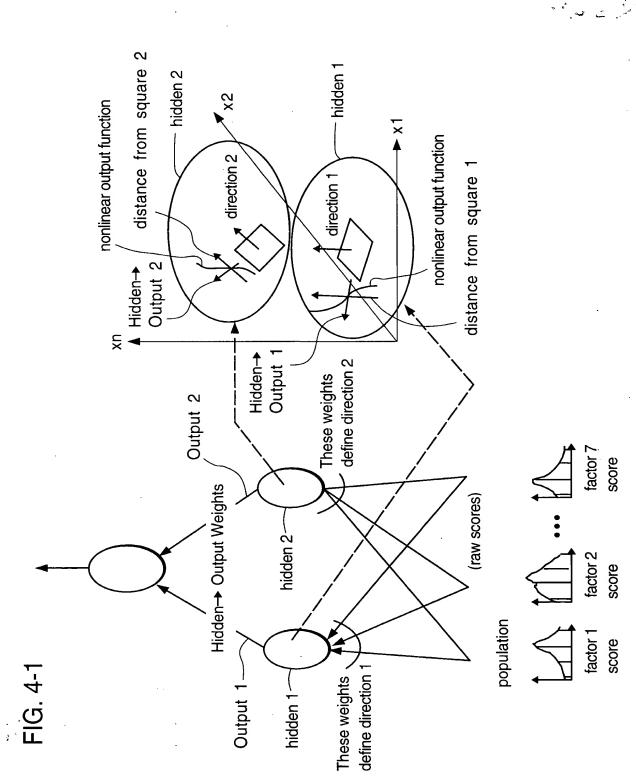


FIG. 3-16

FIG. 3-17





Raw Data

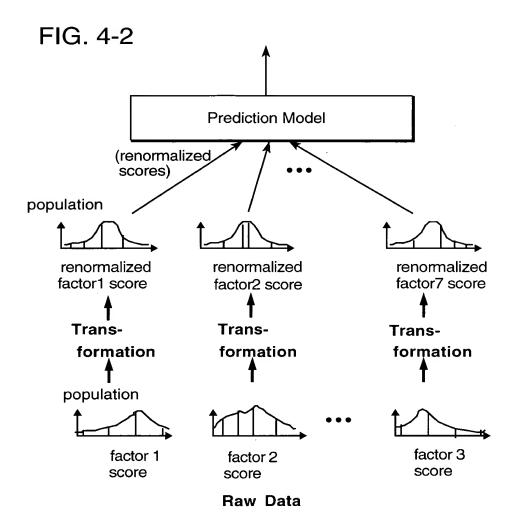


Table 4.1

Prediction of Outcome from Baseline Symptoms														
Symptom	Treatment													
HDRS Item	Other	Tricyclic							MAOI		SSRI	Psycho- therapy		ECT
		Ami	Nor	IMI	DMI	Clo	Lev	Мар	Phe	Tran	Flu	IPT	CBT	ECT
Severity	5 <u>,9</u>	<u>10-</u>		<u>10-</u> ,11 <u>,16</u> + <u>,17+</u>	1,8	8,13	<u>3</u> _	<u>3–,6+</u>	<u>17+</u>		1	<u>16+</u>	7	<u>14-</u>
Depressed Mood	2	<u>10-,</u> 15	4	<u>10–,</u> 11	1,8	8			4	<u>18+</u>	1			14-
Feelings of Guilt		15		11	1,8	8				18	1			14
Suicide	5	15		11	1,8	8				18	1			14
Insomnia: early	2	15	4	11	1,8	8			12,4	18	1			14
Insomnia: middle	2	<u>15-</u>	4	11	1,8	8			12,4	<u>18–</u>	1			14
Insomnia: late	2	15	4	11 <u>,12+</u>	1,8	8			4	<u>18-</u>	1			14
Work and Interests		15	4	11 ,12	1,8	8			11	18	1			14
Retardation	2	10, 15	4	10,11 <u>,12+</u>	1,8	8			4	<u>18+</u>	1			18
Agitation	2	10, 15		10,11,12	1,8	8			12,4	18	1			14-
Anxiety : somatic	2	10,15	4	10, 11	1,8	8			4	18	1			
Anxiety : psychic	2	10,15	4	10, 11	1,8	8			4	18	1			
Somatic: gastrointestinal		<u>15–</u>		11	1,8	8				18	1			<u>14</u>
Somatic: general		10, 15	4	10, 11	1,8	8			4	18	1			
Genital symptoms		15		11, 12	1,8	8			11	18	1			14
Hypochondriasis		<u>15–</u>	4	11	1,8	8			4	18	1			14
Loss of Weight (or change)	2	15	4	11, 12	1,8	8			12,4	<u>18+</u>	1			14
Insight		<u>15+</u>		11	1,8	8				18	1			
Diurnal variation		15	4	11, 12	1,8	8			12,16	18	1			14
Depersonaliztion and derealization		15		11	1,8	8				18	1			
Paranoid symptoms	2	15		11	1,8	8				18	1			
Obsessive and compulsive	2	15		11	1,8	8				18	1			

## Table 4.2

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